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FIG. 1A

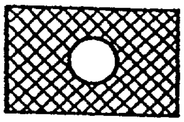

FIG. 1B

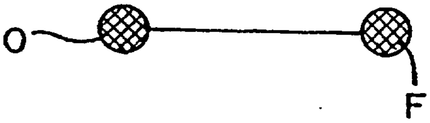

FIG. 1C

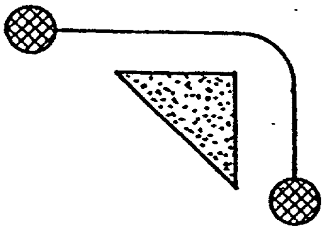

FIG. 1D

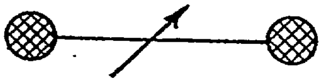

FIG. 1E

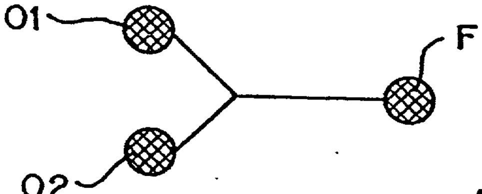

FIG. 1F

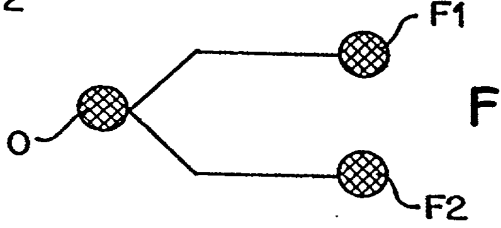

FIG. 1G

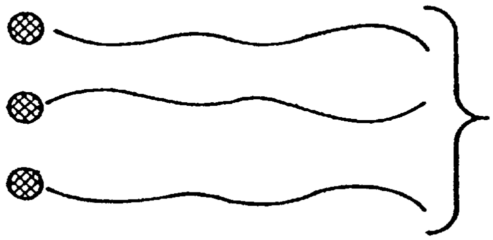

FIG. 1H

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FIG. 2A

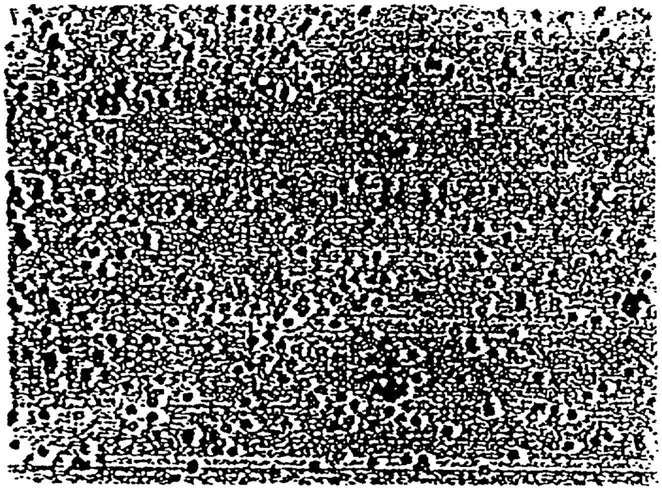

FIG. 2B

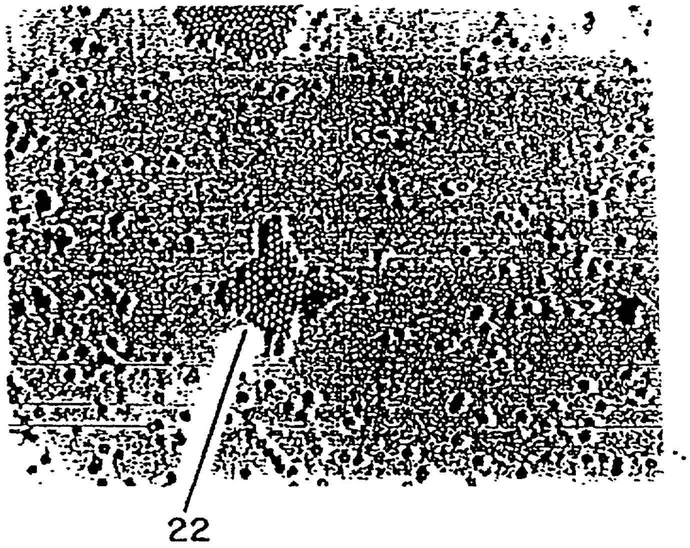

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FIG. 2C

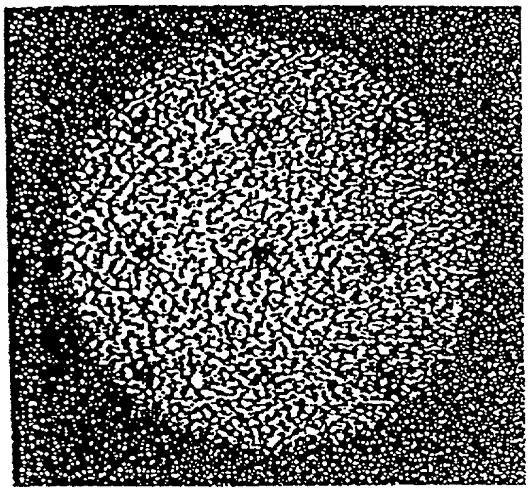
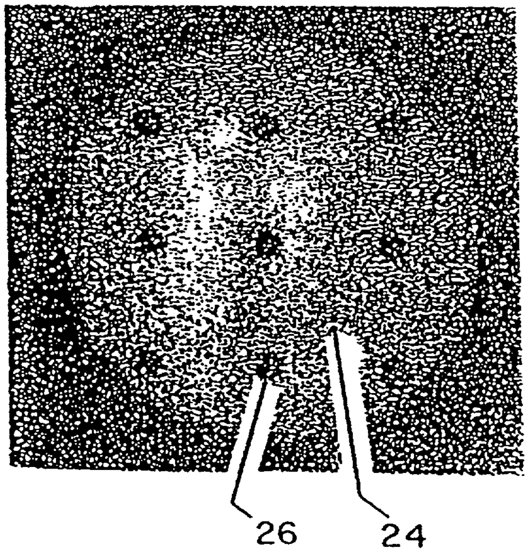


FIG. 2D



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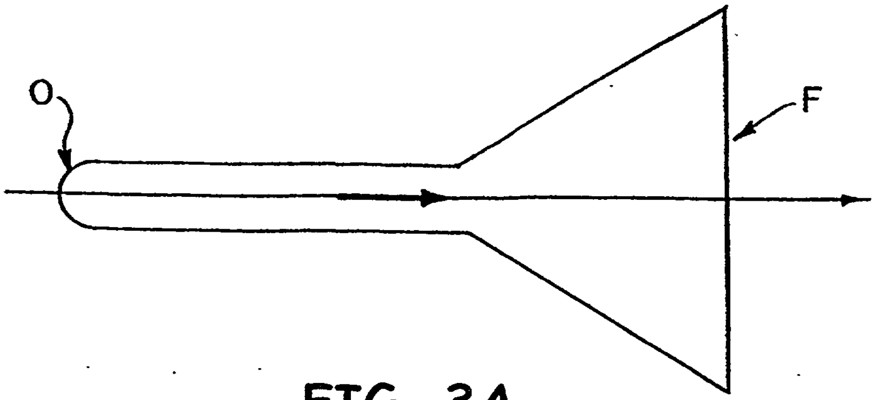


FIG. 3A

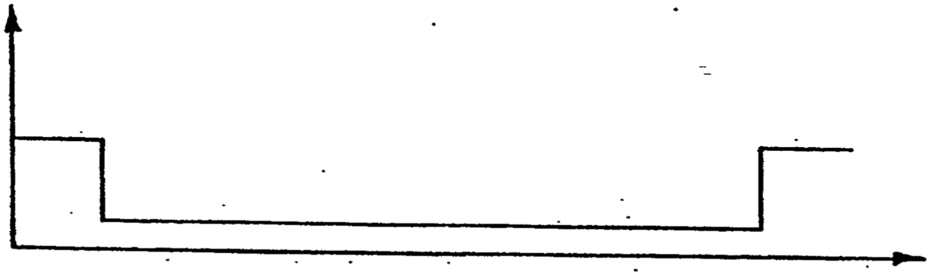
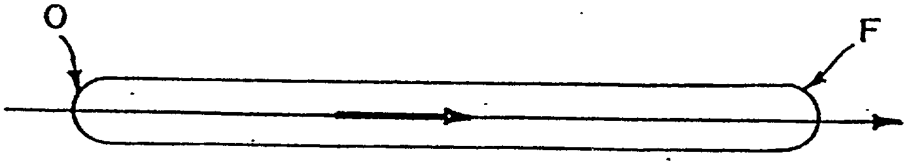


FIG. 3B



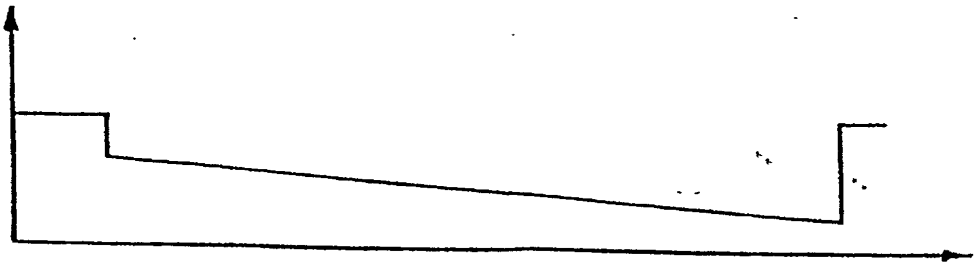


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FIG. 3C

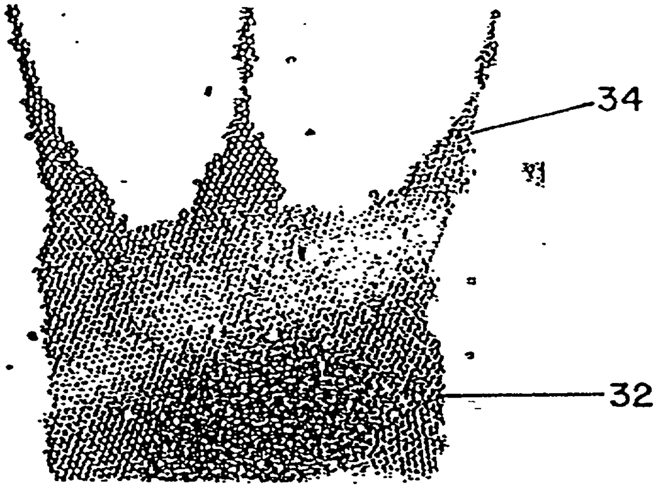
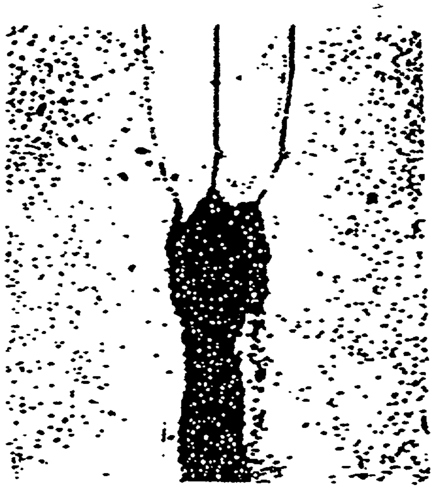


FIG. 3D



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10088554 .082502

FIG. 4A

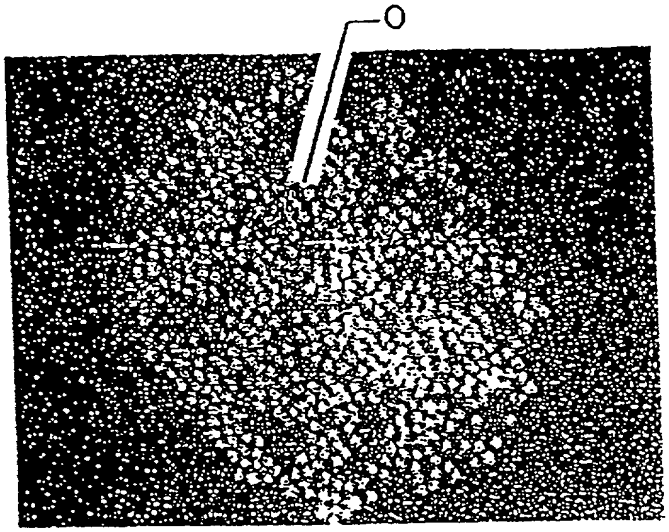

FIG. 4B

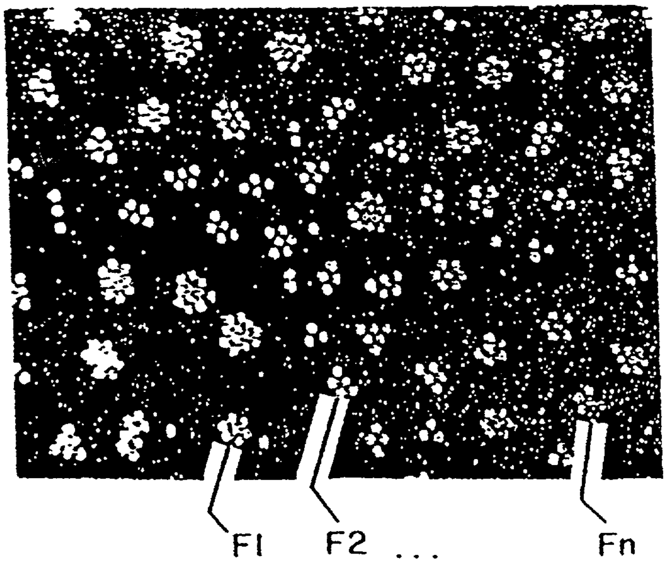

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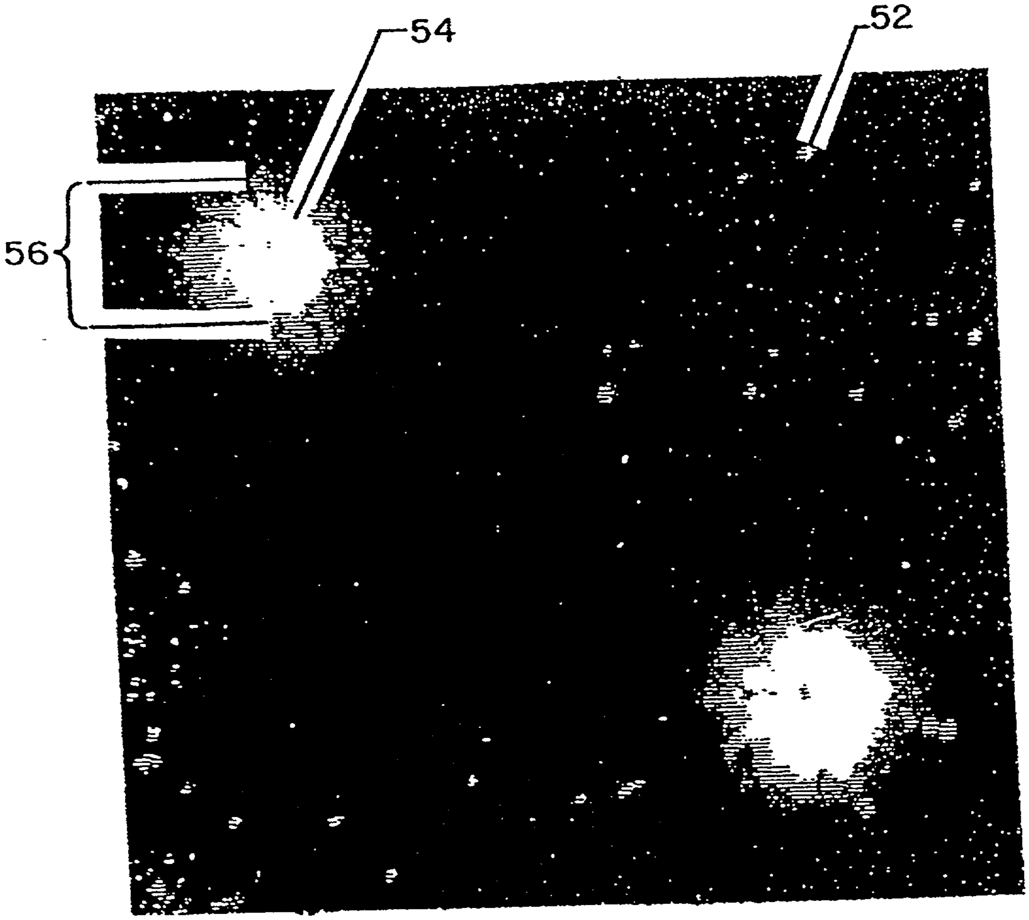
FIG. 5



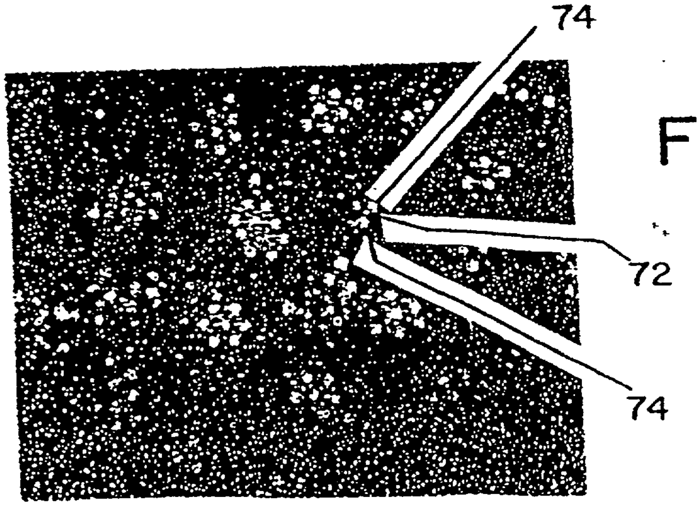


FIG. 7

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FIG. 6A

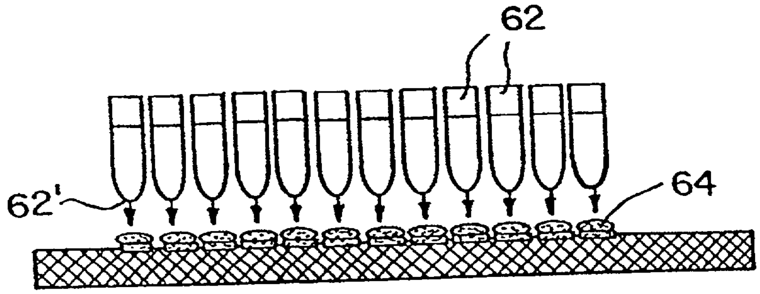

FIG. 6B

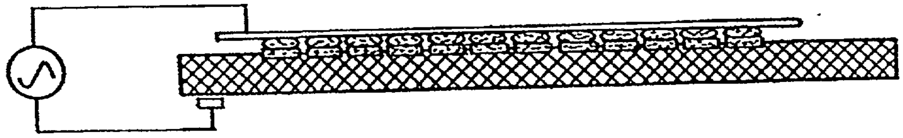

FIG. 6C

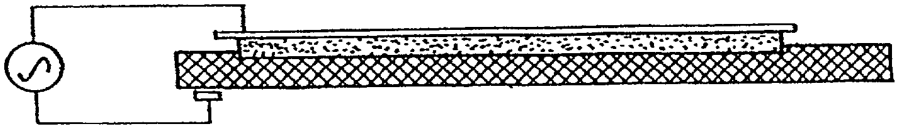

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FIG. 8

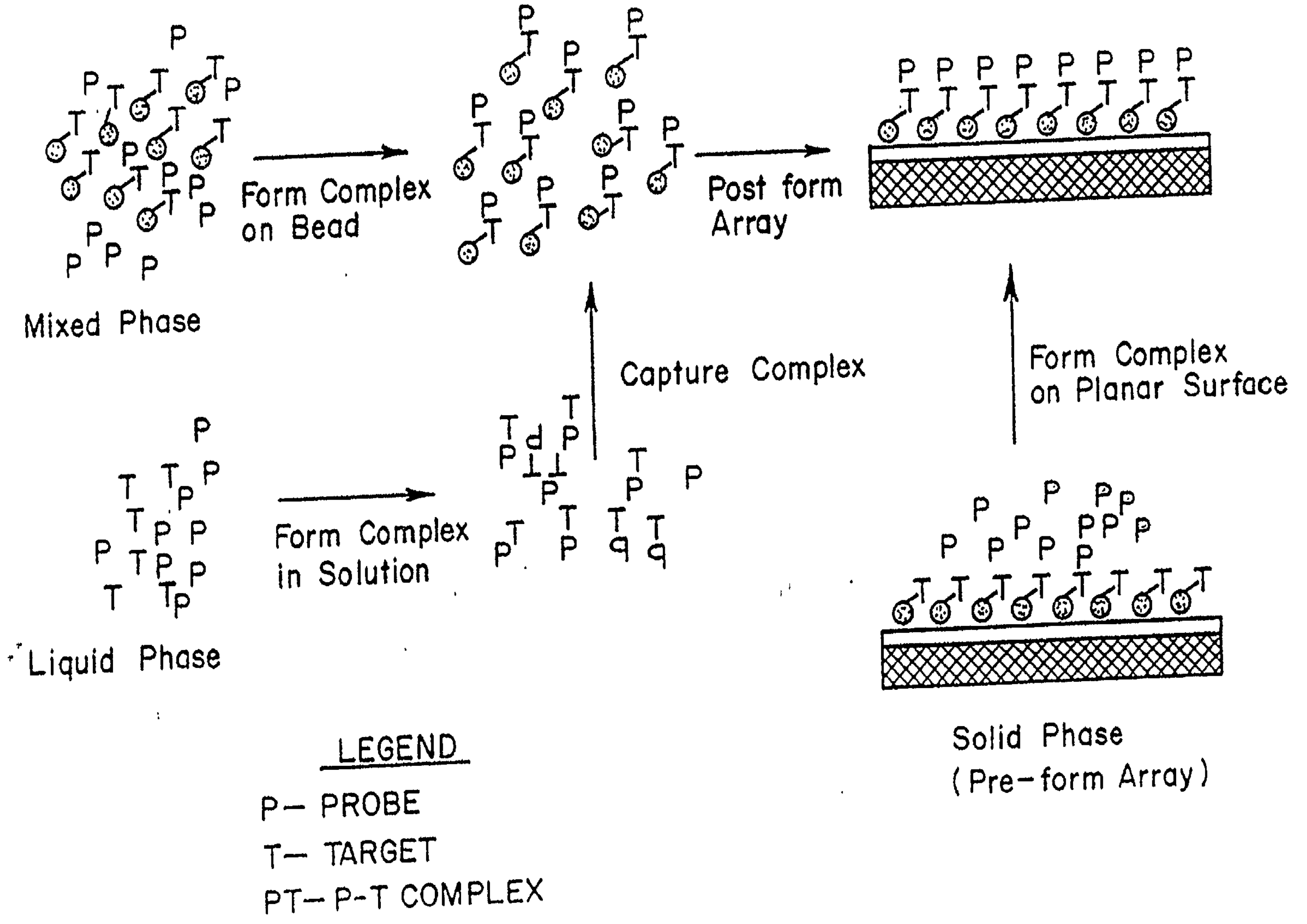

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FIG. 9A

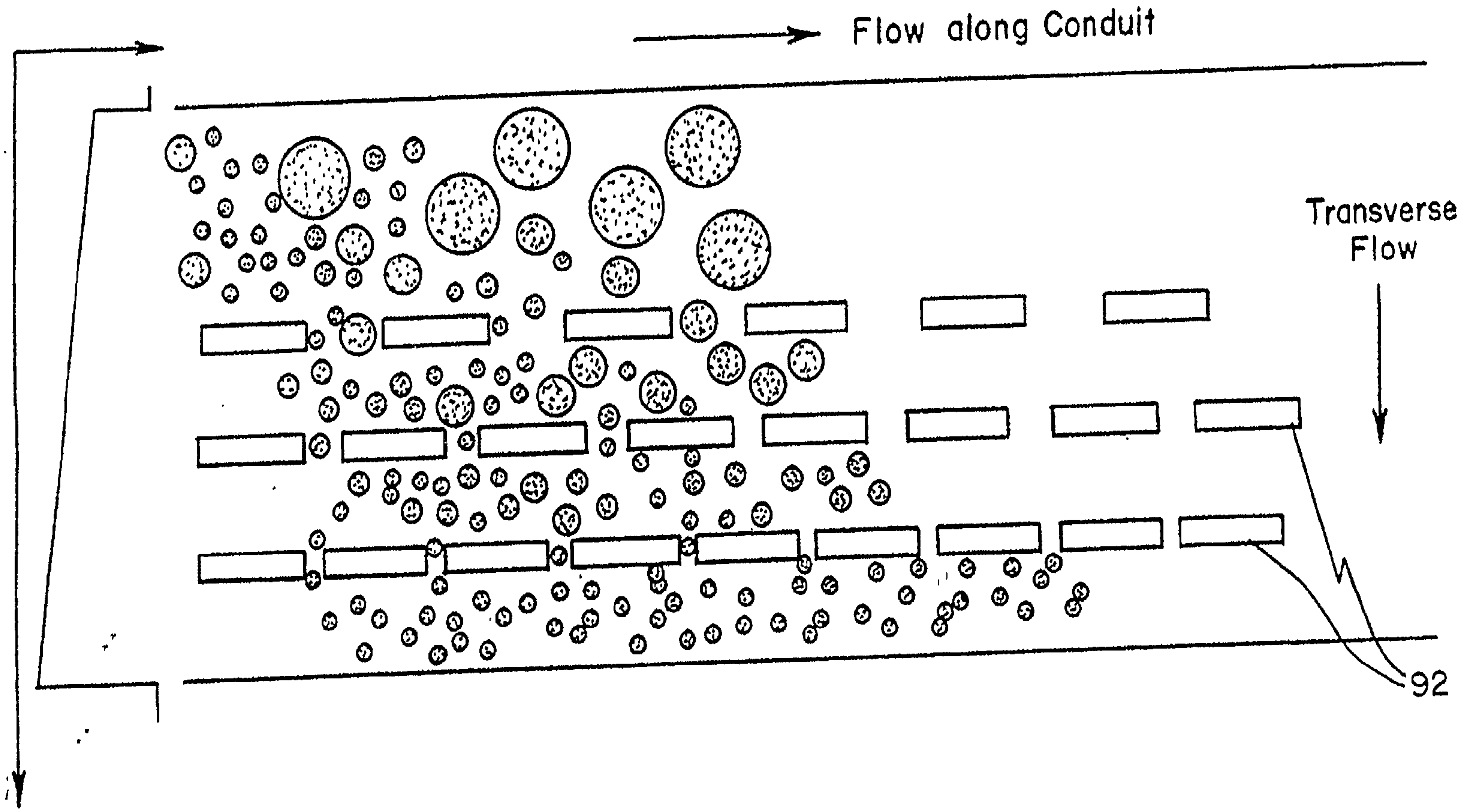

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FIG. 9B

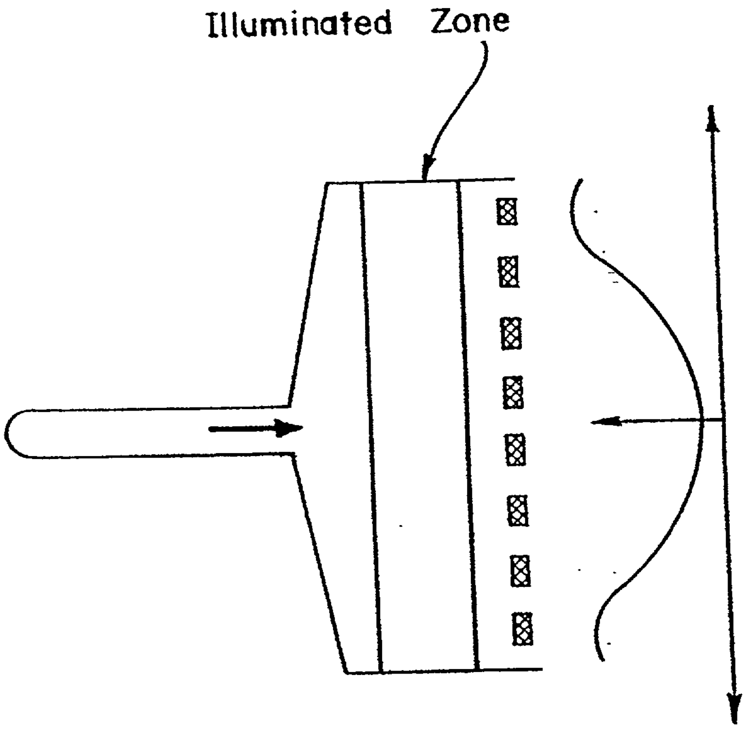

FIG. 9C

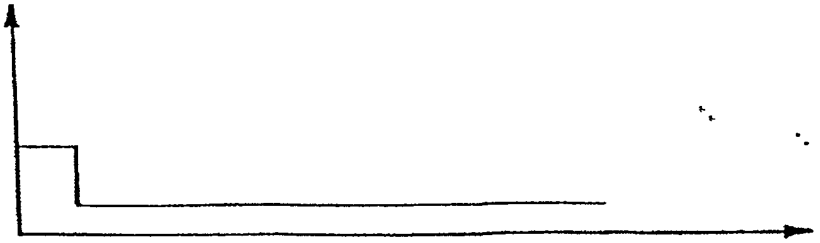

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FIG. 10

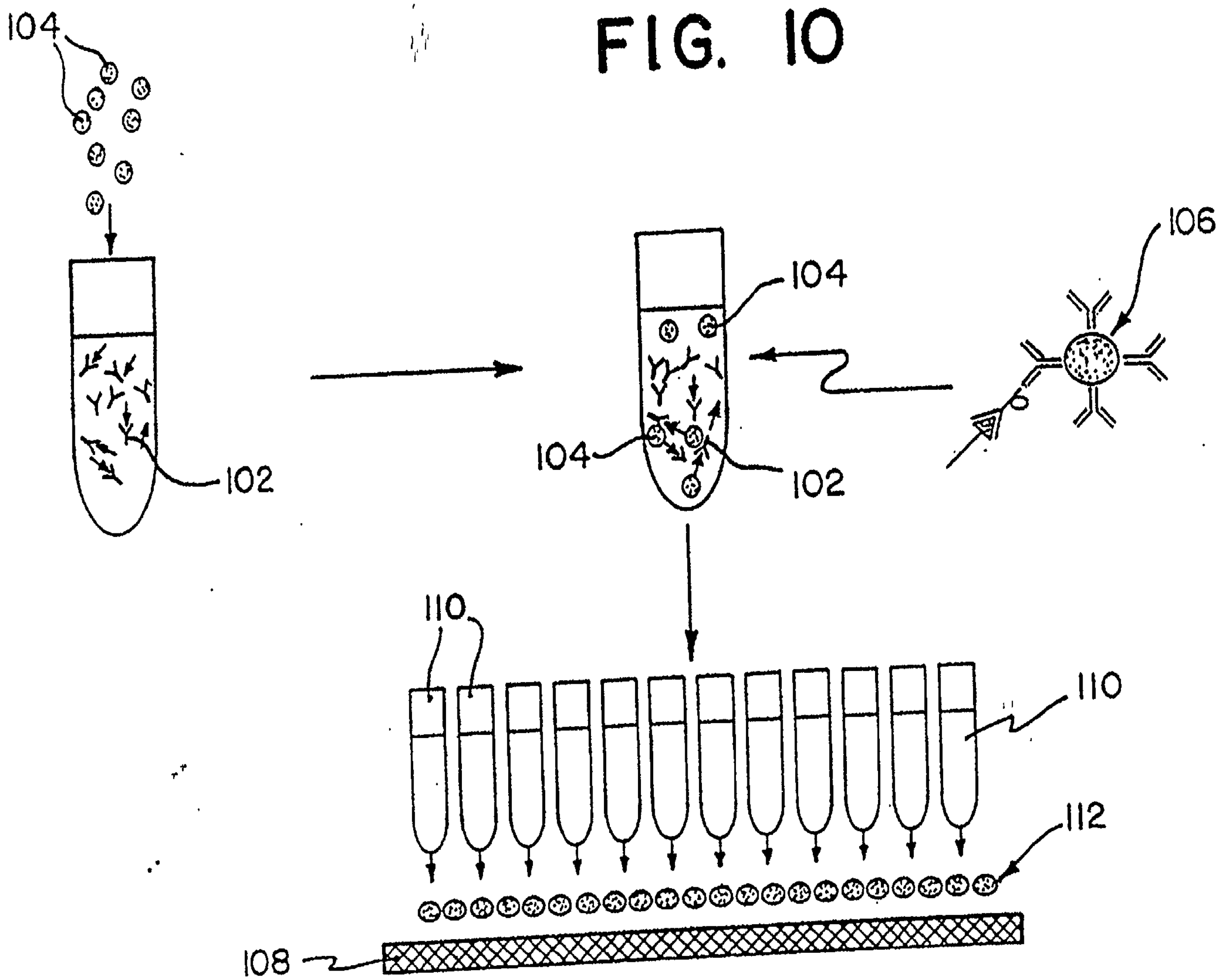

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FIG. 11A

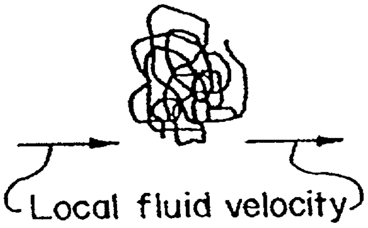

FIG. 11B

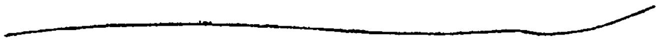

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FIG. 11C

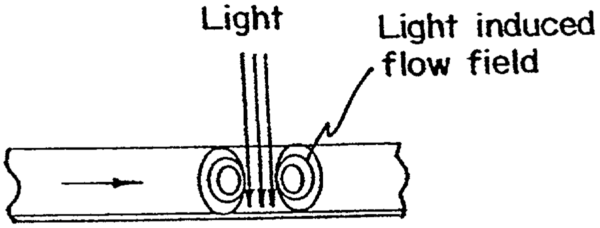


FIG. 11D

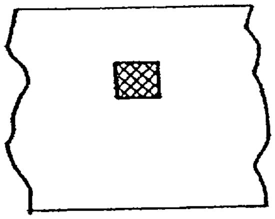
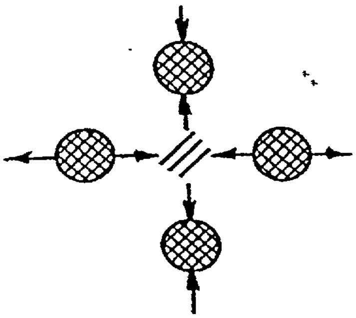


FIG. 11E



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ILLUMINATION PATTERN GENERATOR

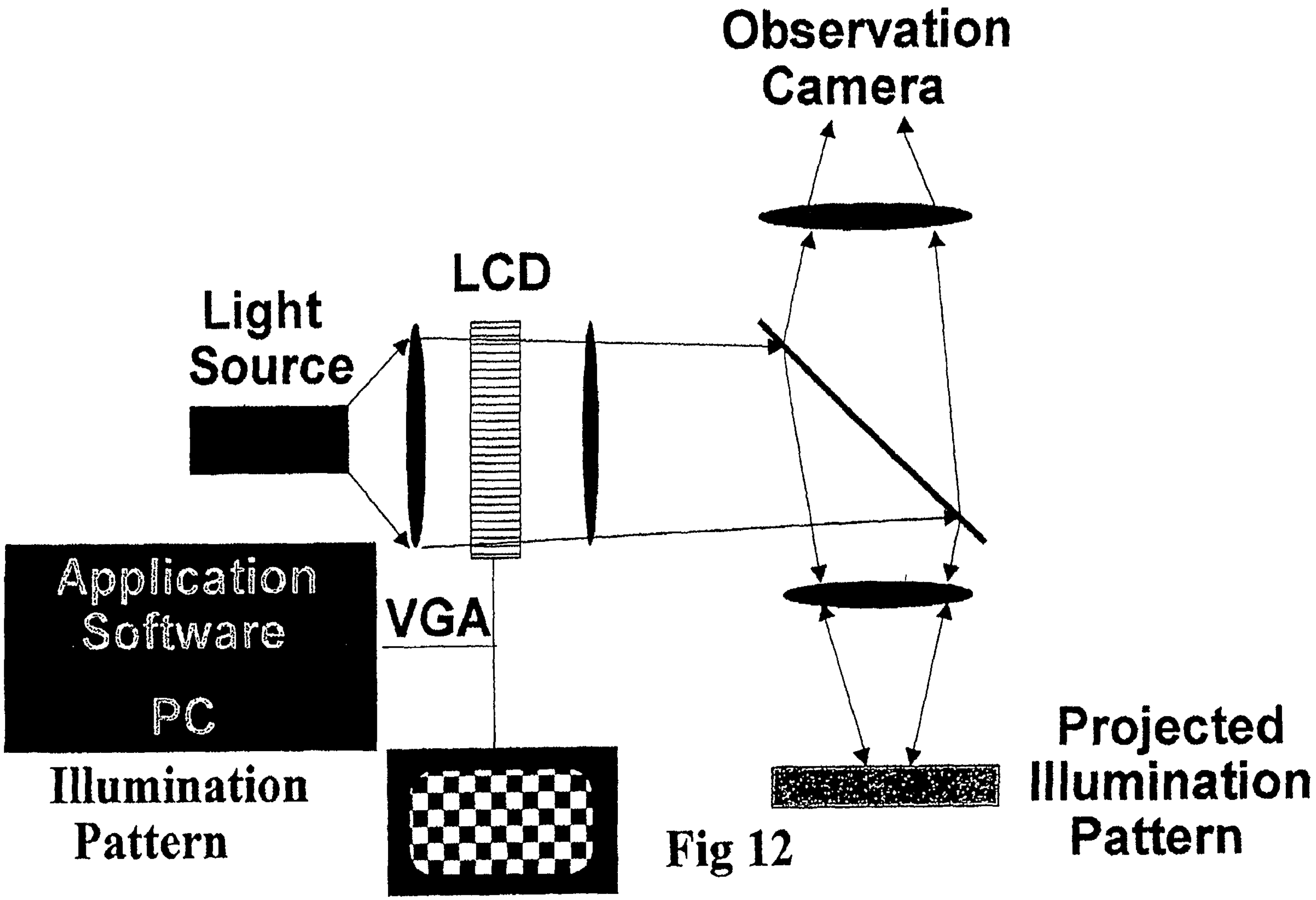

Fig 12

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LCD-PARSE OPTICAL DESIGN

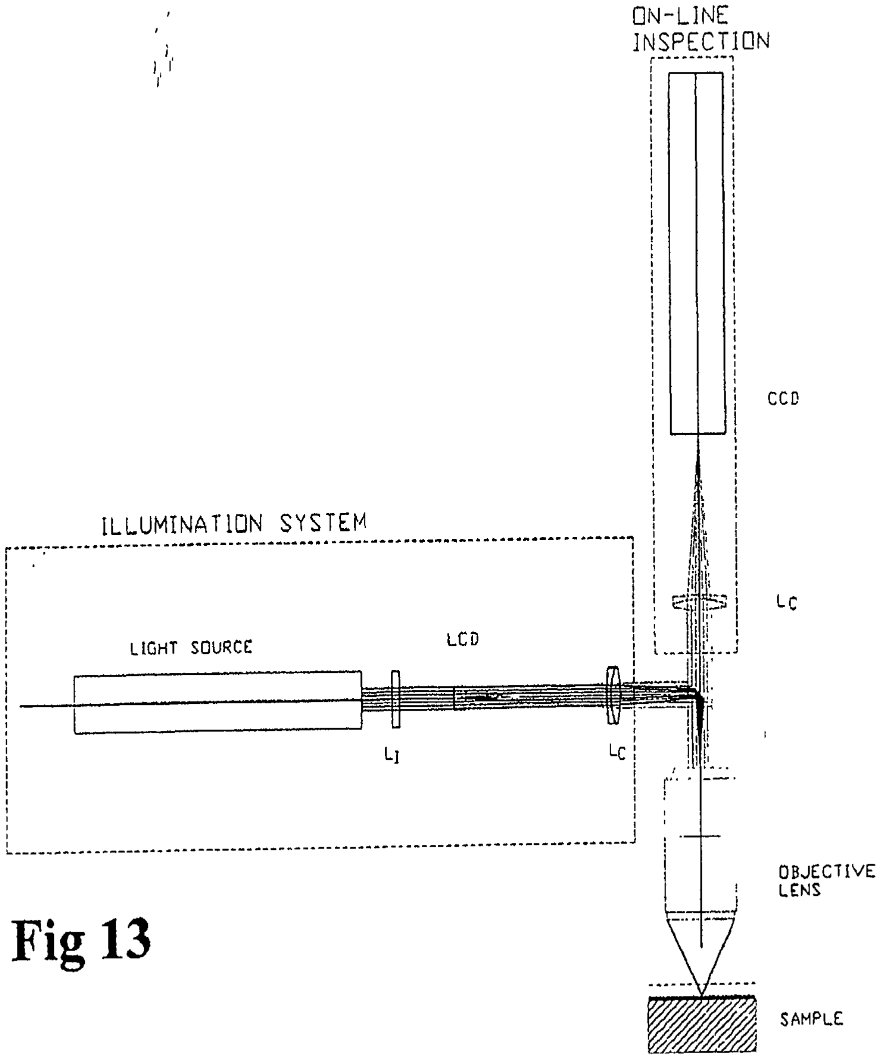

Fig 13

ARRAY SHAPE ADJUSTMENTS

CIRCLE

FIG. 14A

HORIZONTAL. LINE

FIG. 14C

VERTICAL LINE

FIG. 14B

SQUARE

FIG. 14D

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COLLECTION AND ARRAY ASSEMBLY

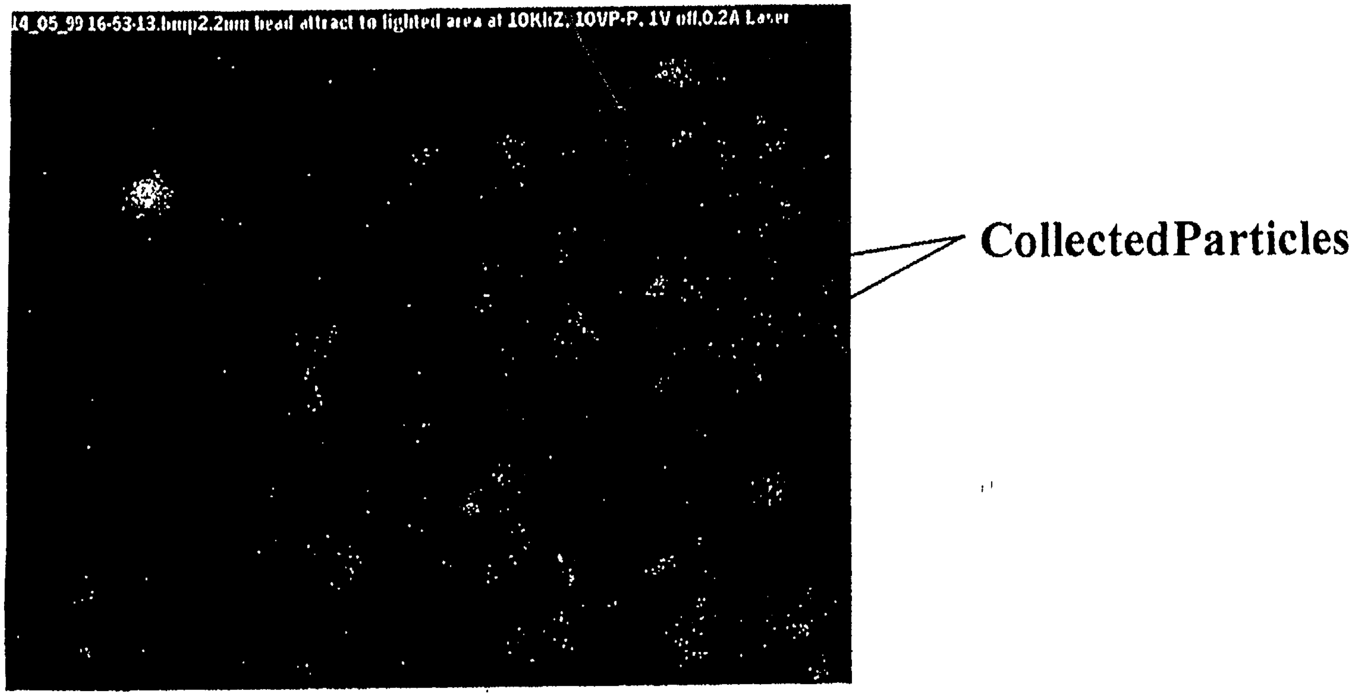

FIG. 15A

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EXPULSION AND CONFINEMENT

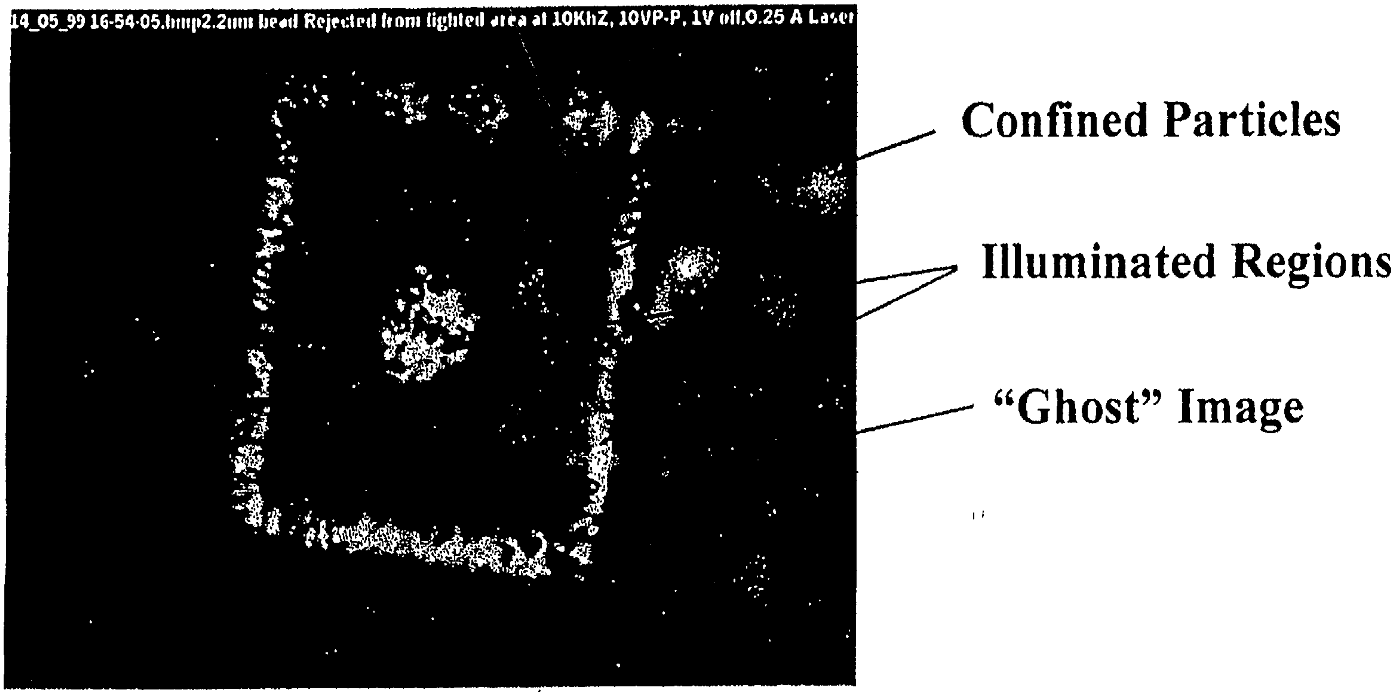

FIG. 15B

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DRAG AND DROP

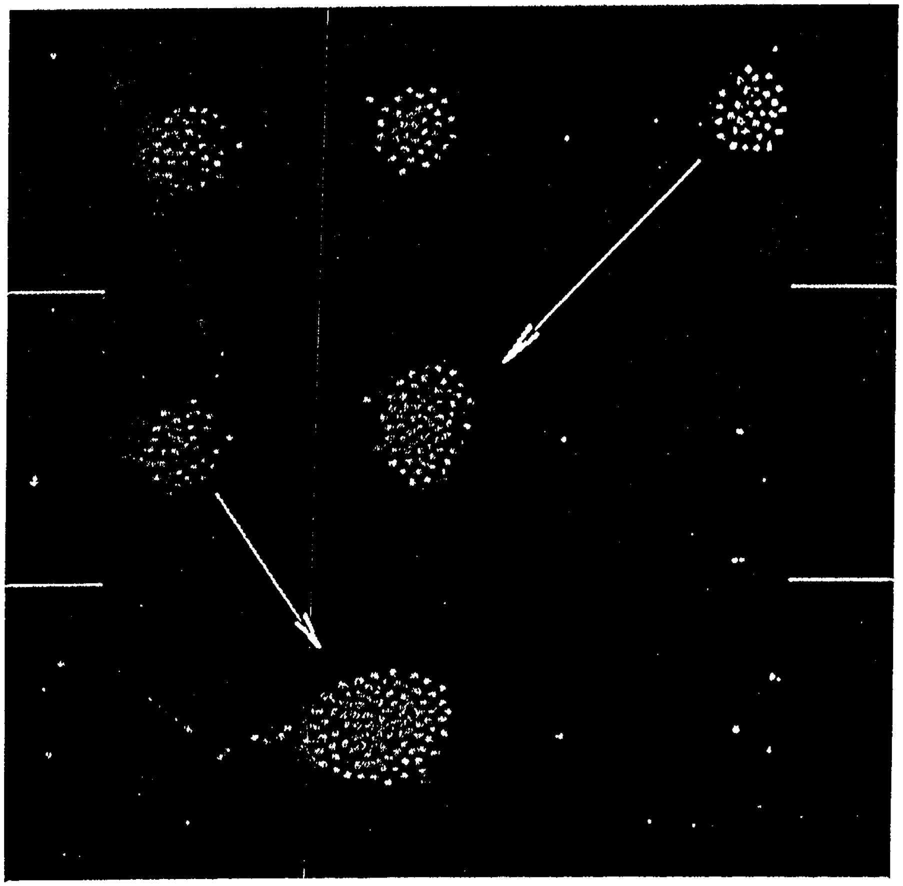

Figure 16

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Porgrammable Array Reconfiguration and Segmentation

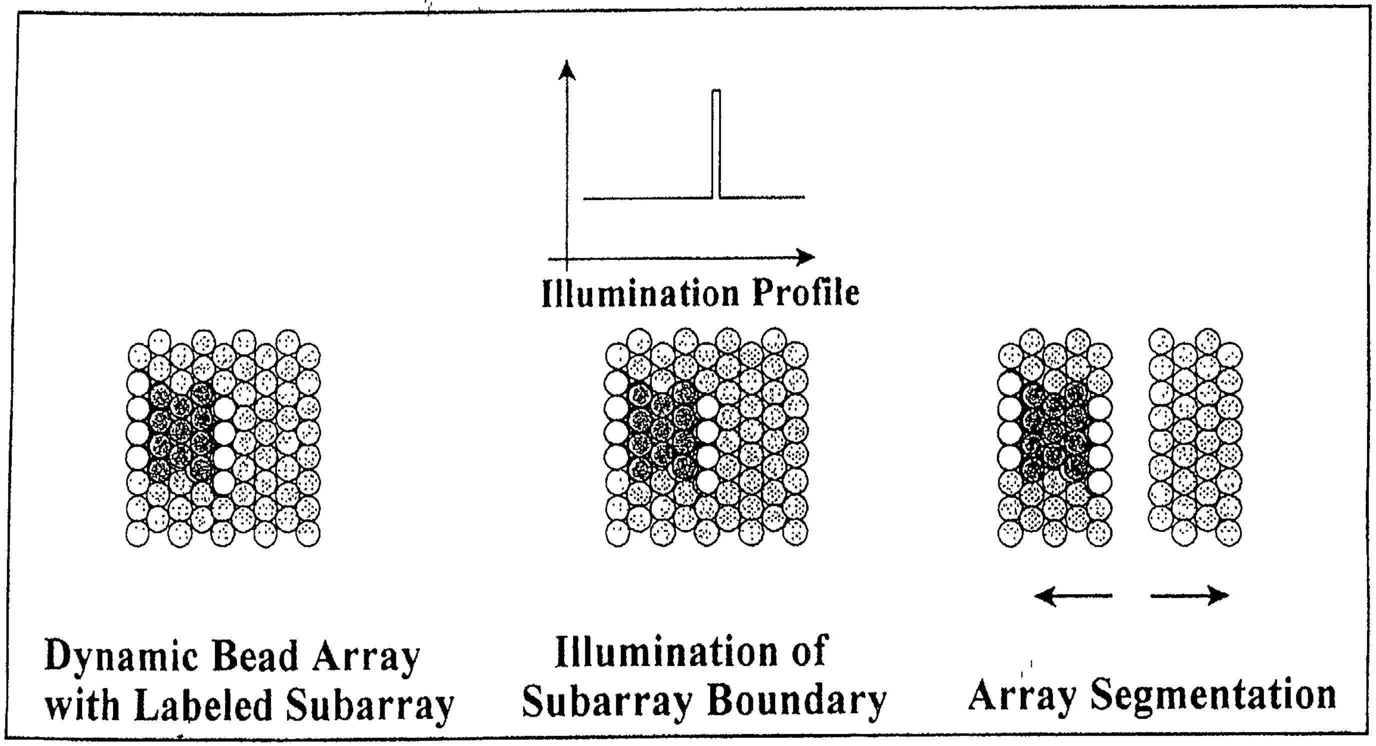

Figure 17

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LCD PARSE

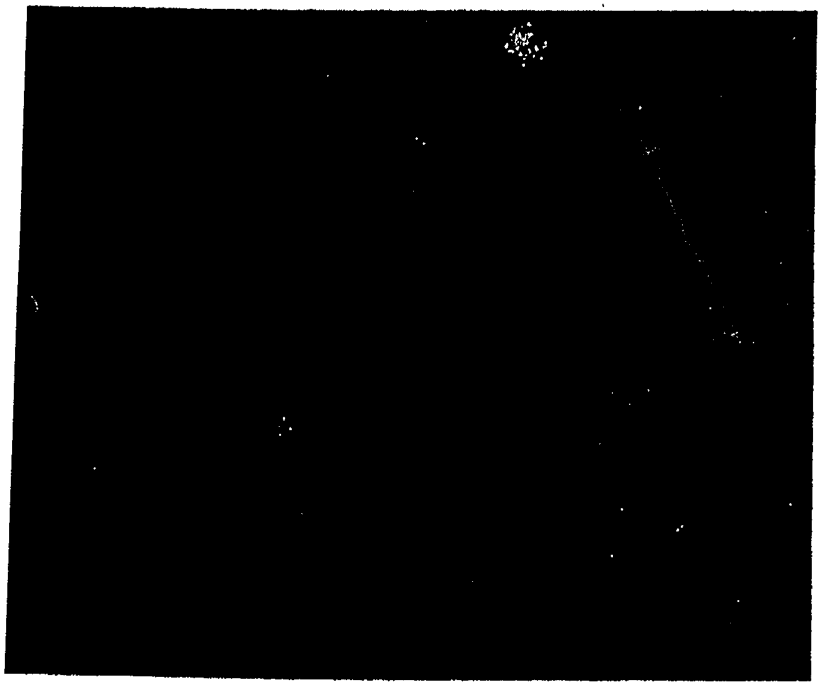

FIG. 18A

FIG. 18B

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LCD PARSE

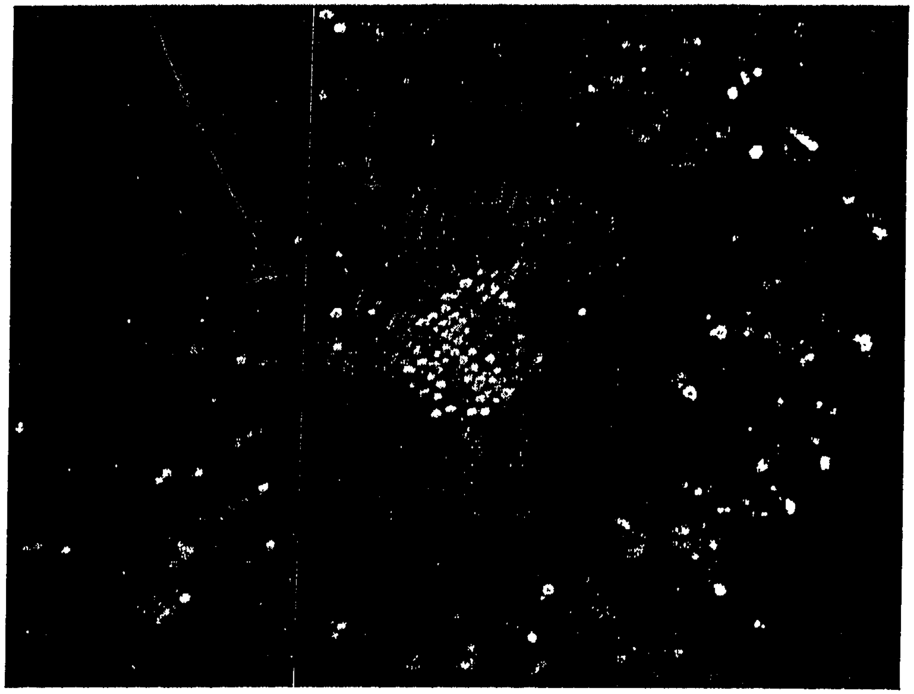

Figure 19

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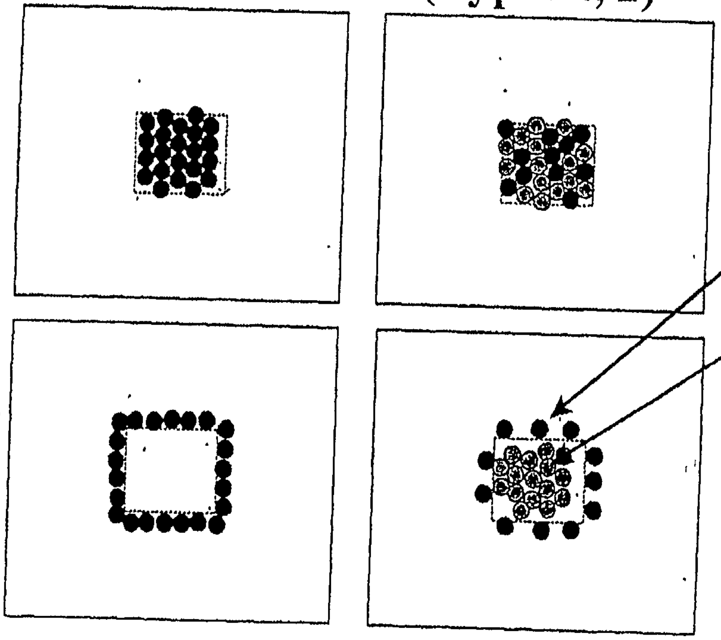
FRACTIONATION

Differential Frequency Dependence of Particle Expulsion
(NOTE: ω_c denotes a characeristic frequency)



Single Particle
(Type 1)

Mixture
(Types 1, 2)

Particle Collection
and Array Assembly
$\omega < \omega\_c$

Particle Type 1

Particle Type 2

Particle Expulsion
$\omega\_c < \omega$

Differential Expulsion
$\omega\_c (1) < \omega < \omega\_c (2)$

$\omega\_c \text{ (Type 1)} < \omega\_c \text{ (Type 2)}$

FIG. 20A

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FRACTIONATION

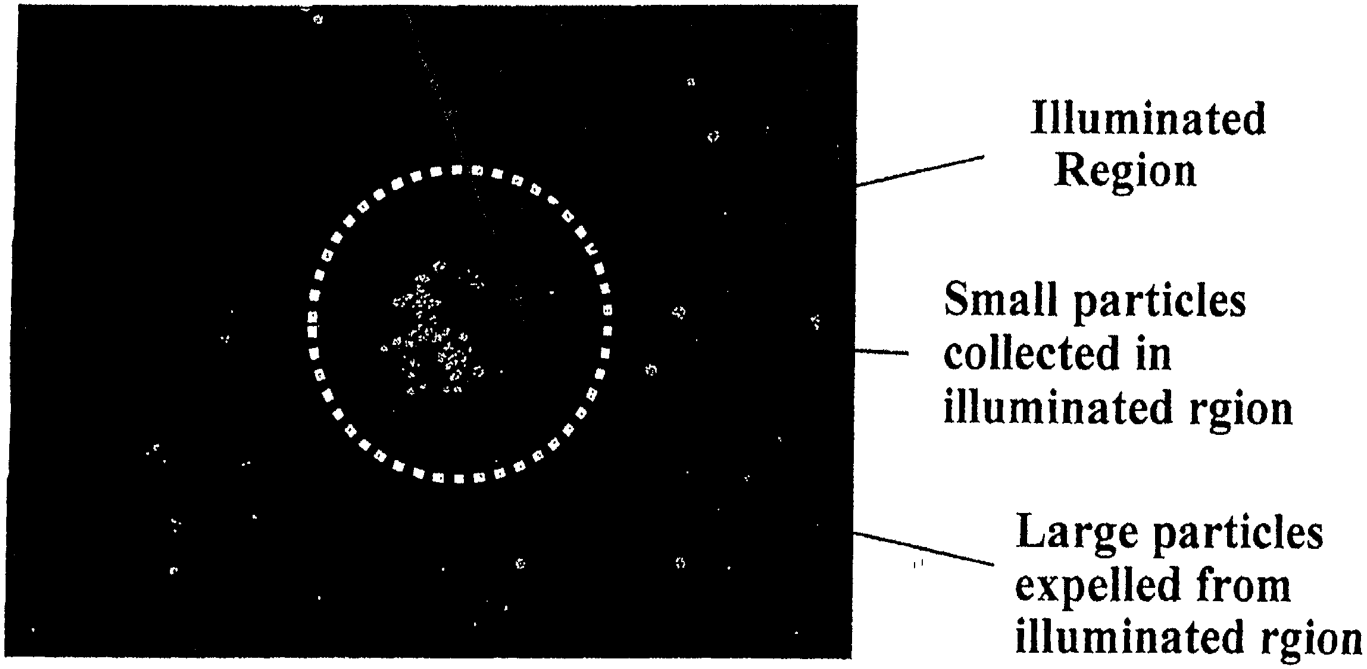

FIG. 20B

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LCD PARSE

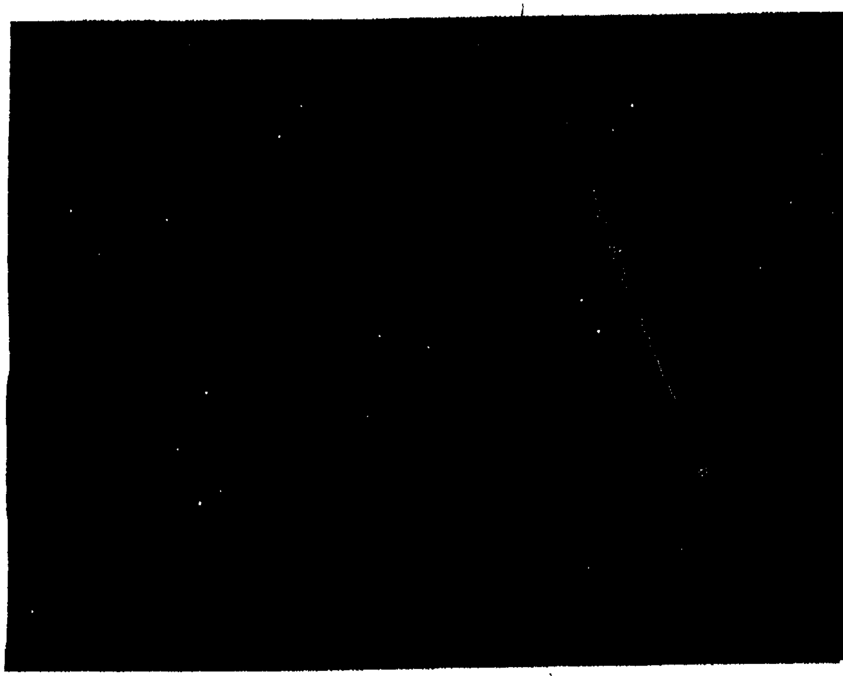

FIG. 21A

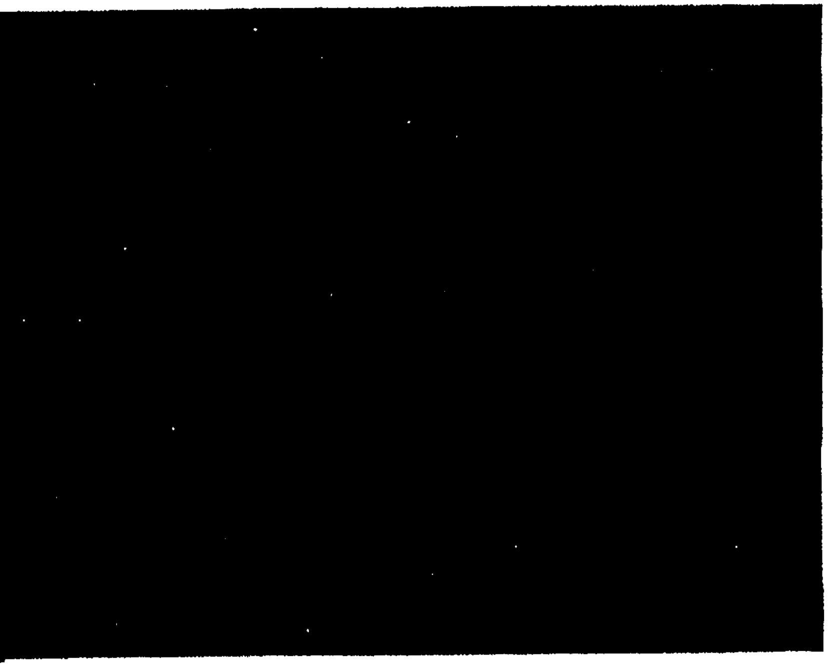

FIG. 21B

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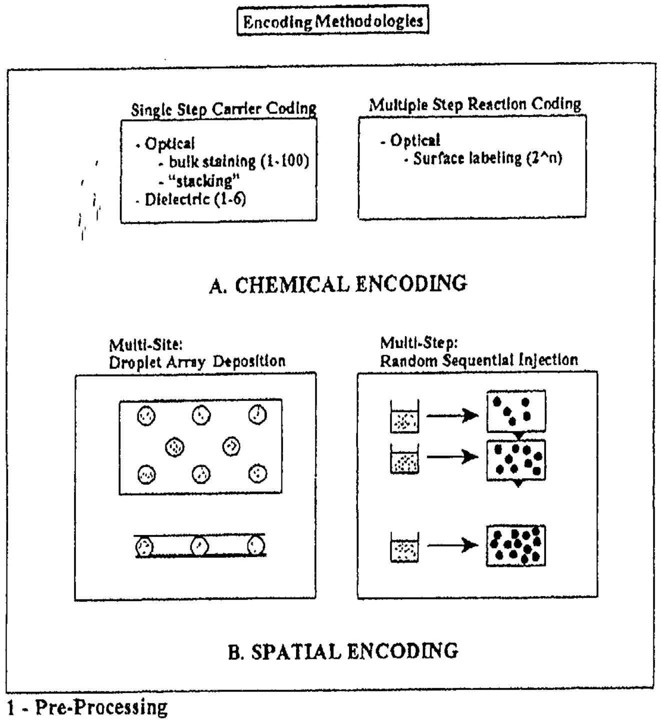

FIG. 22A

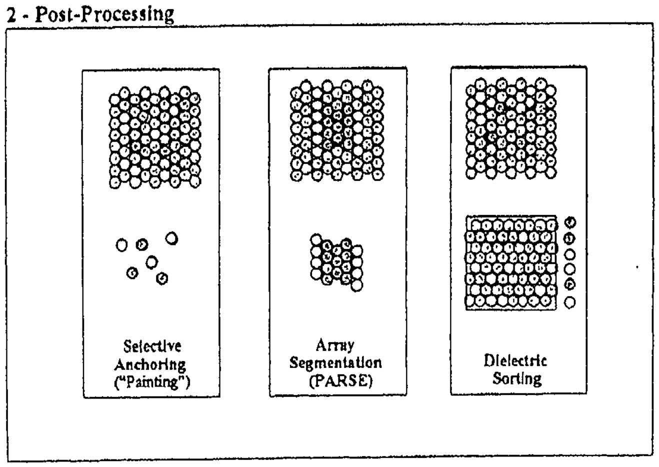

FIG. 22B

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RANDOM SEQUENTIAL INJECTION

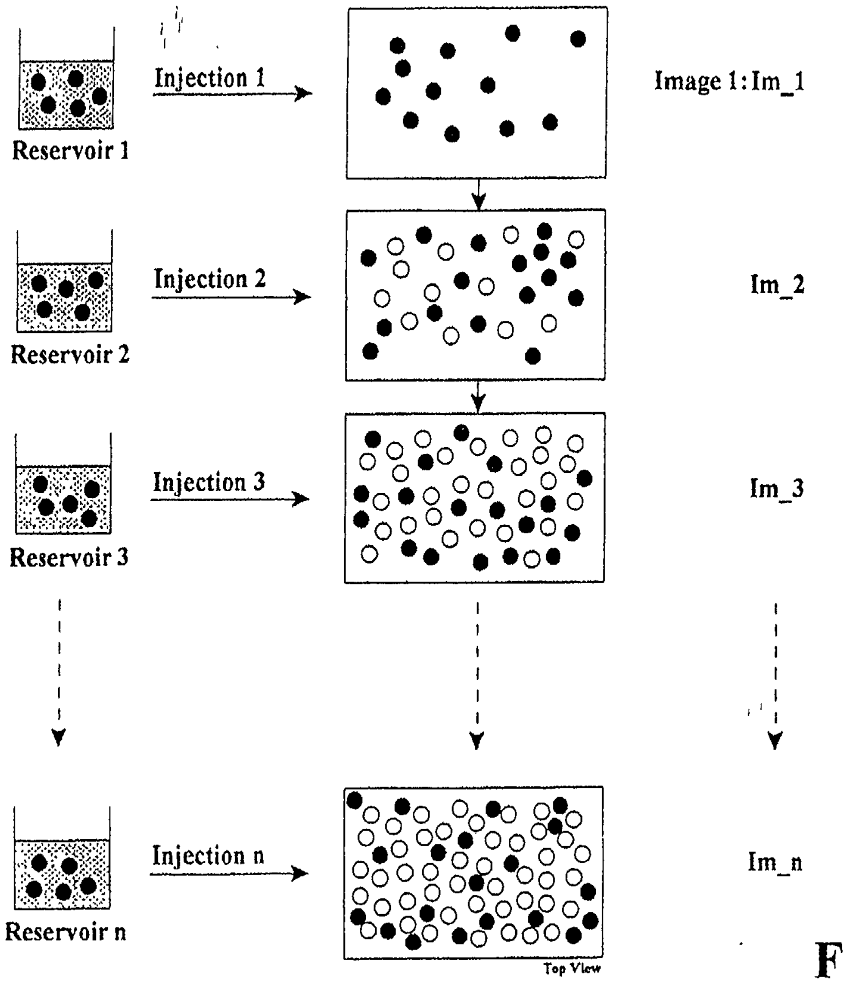

Figure 23

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SEQUENTIAL INJECTION & LIGHT-CONTROLLED ARRAY PLACEMENT

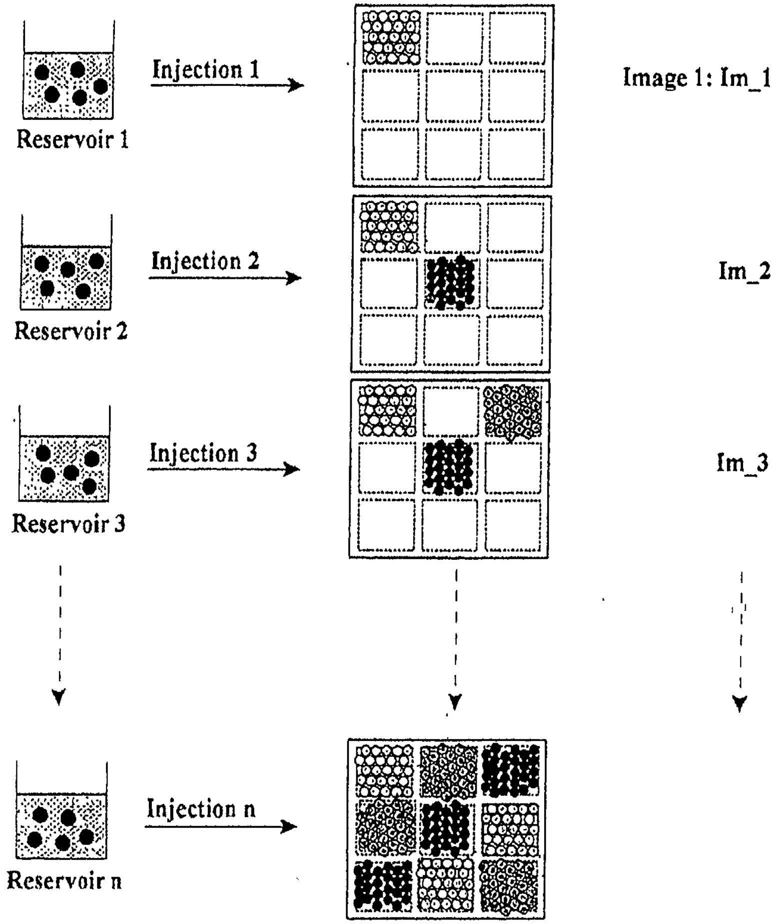

Figure 24

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MACRO-TO-MICRO TANSITION

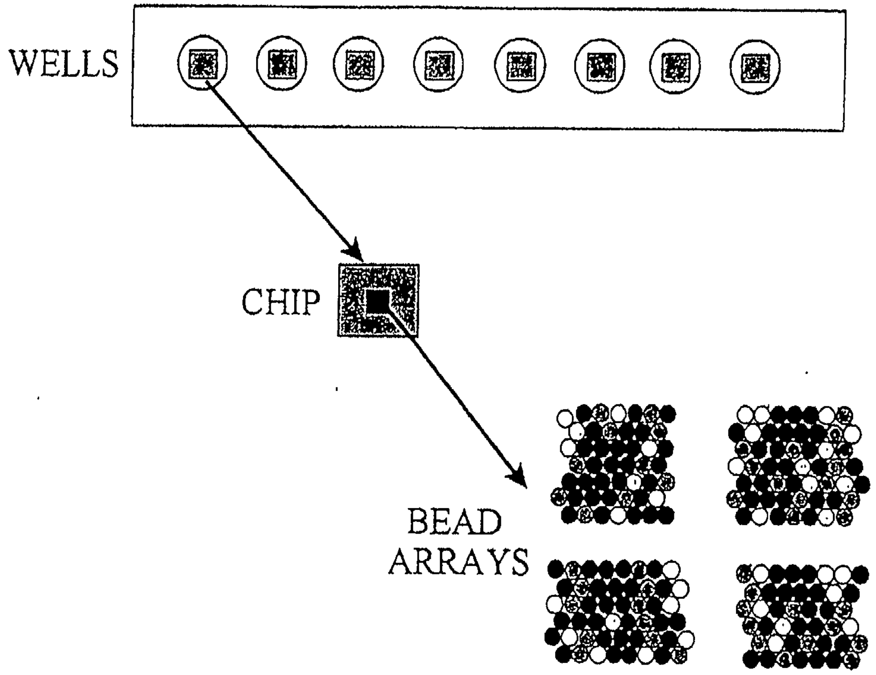

FIG. 25A

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ARRAY ENCODING

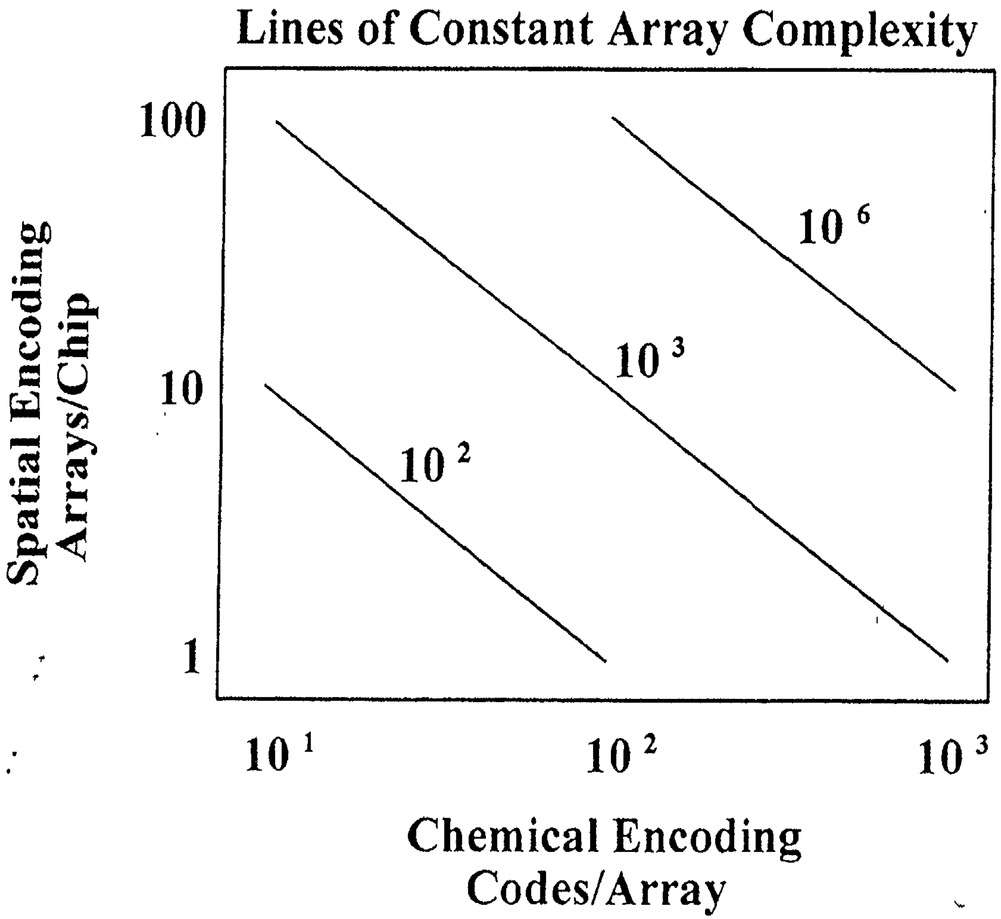

FIG. 25B

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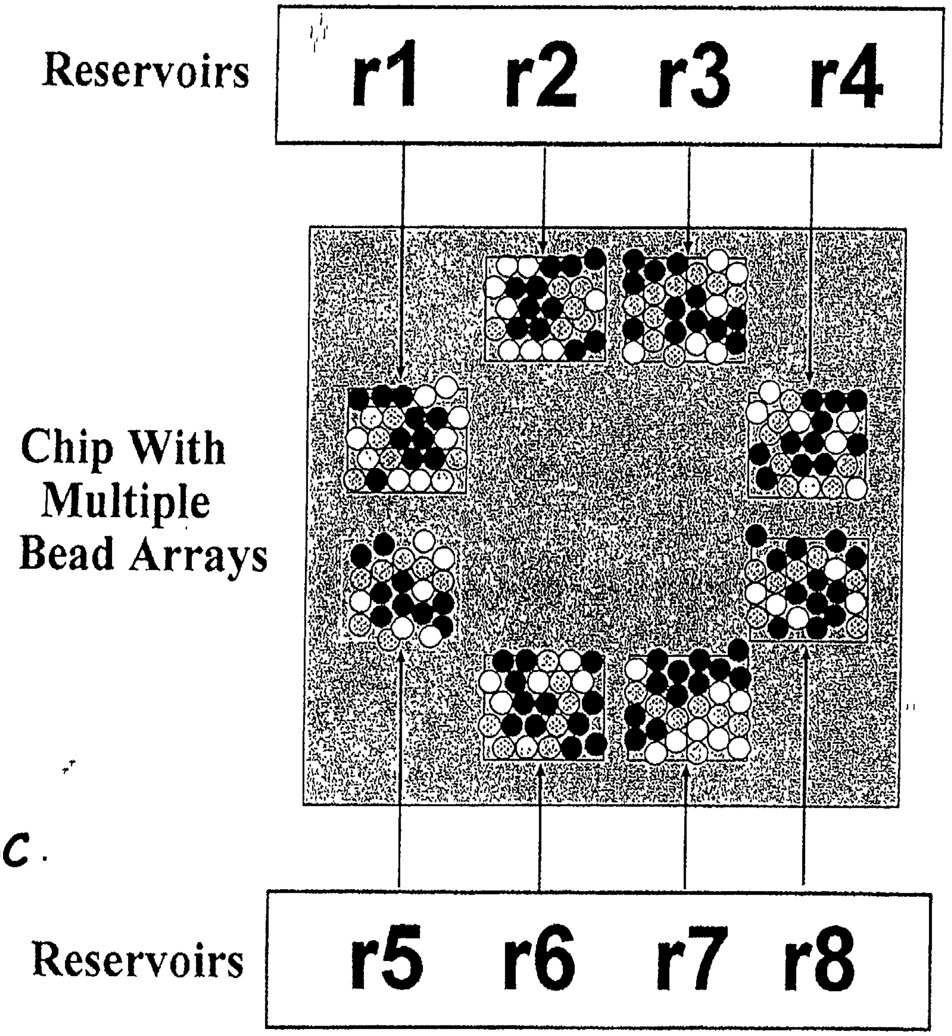
ARRAY ENCODING



Reservoirs

r1 r2 r3 r4

Chip With
Multiple
Bead Arrays

Reservoirs

r5 r6 r7 r8

FIG. 25C.

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SEQUENTIAL ASSEMBLY: "BANDING"

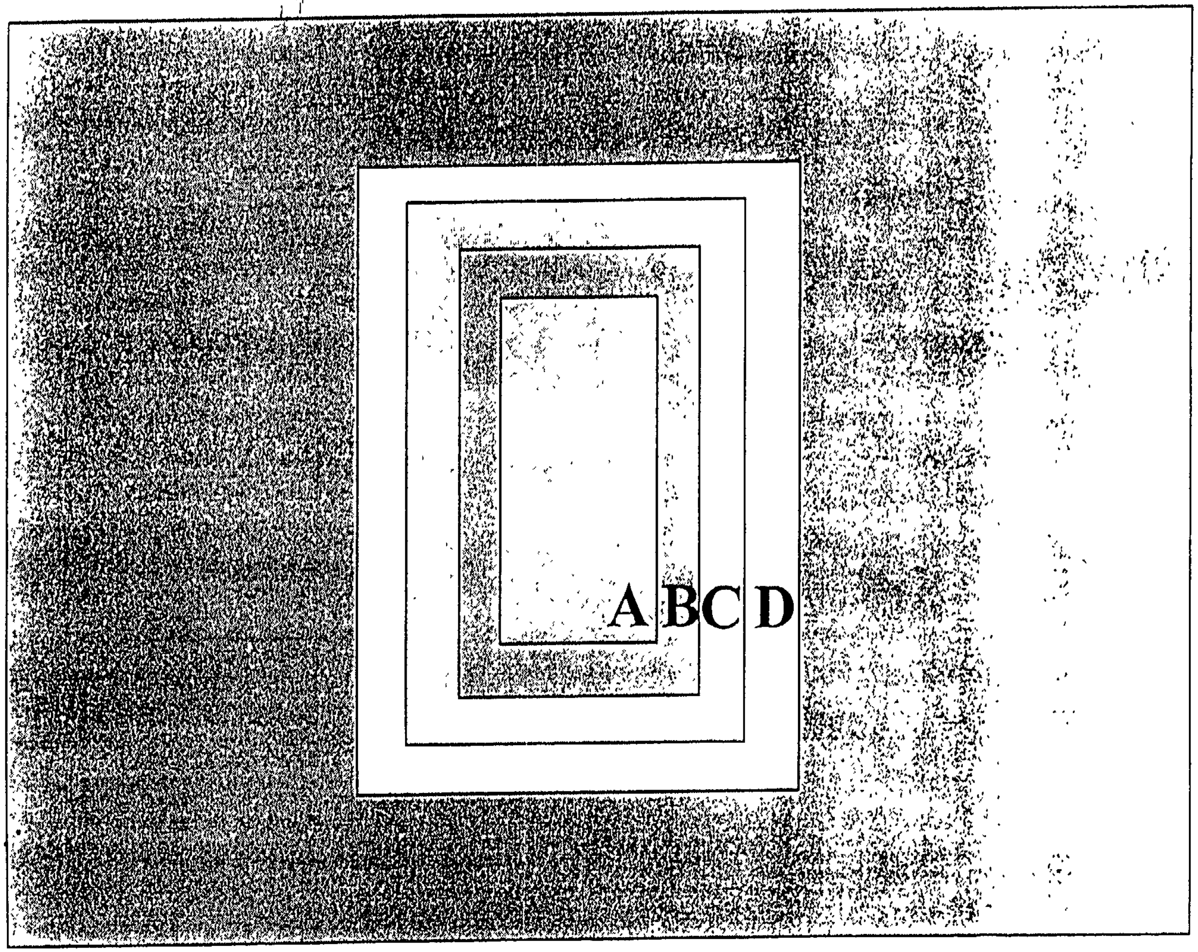

FIG. 26A

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SEQUENTIAL ASSEMBLY: "BANDING"

Mixture of Two Particle Types

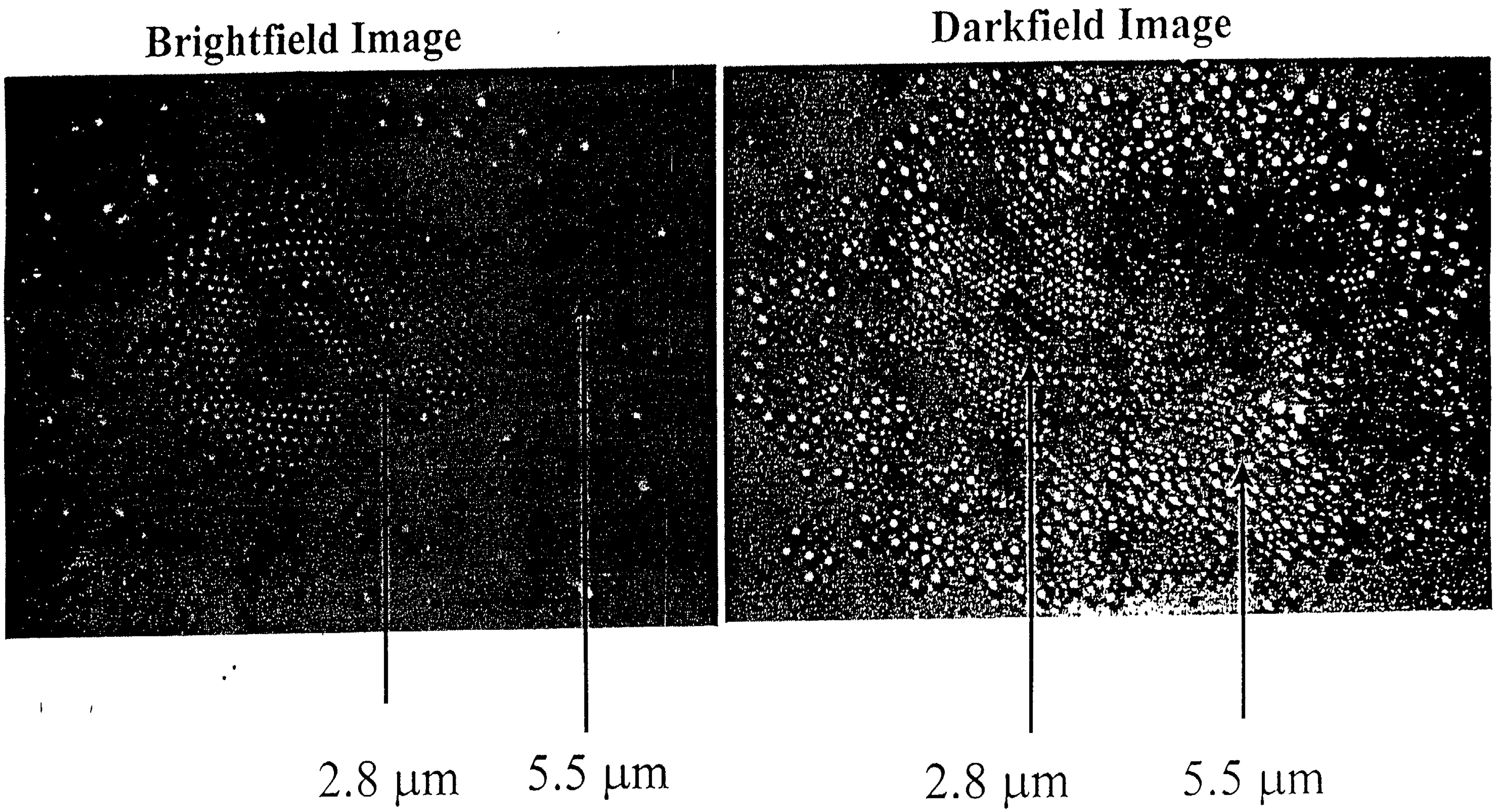

FIG. 26B

IPE AUG 2 6 2002 PATENT & TRADEMARK OFFICE

LCD PARSE

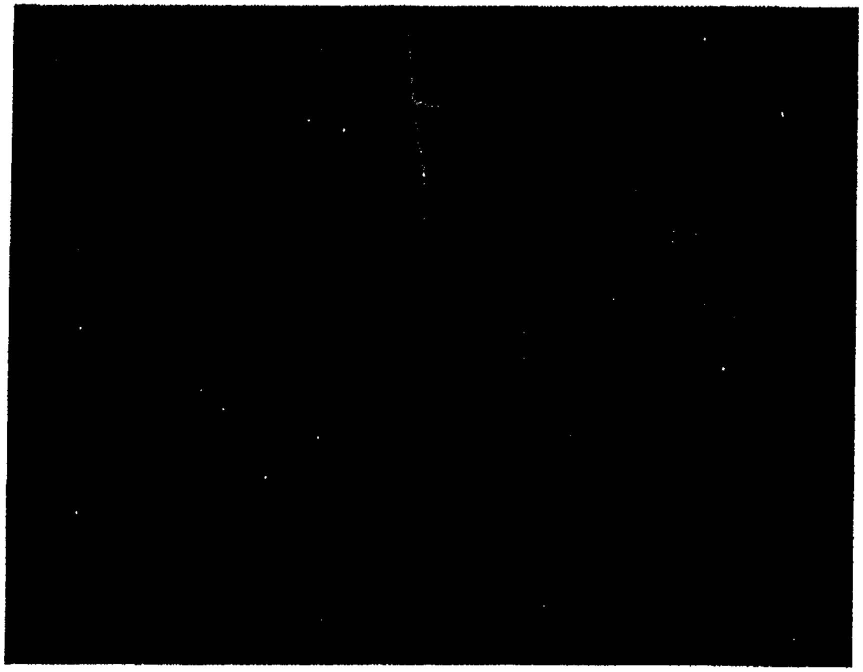

Figure 27

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ARRAY OF RANDOM SUBARRAYS

A UNIQUE TWO-DIMENENSIONAL BAR CODE

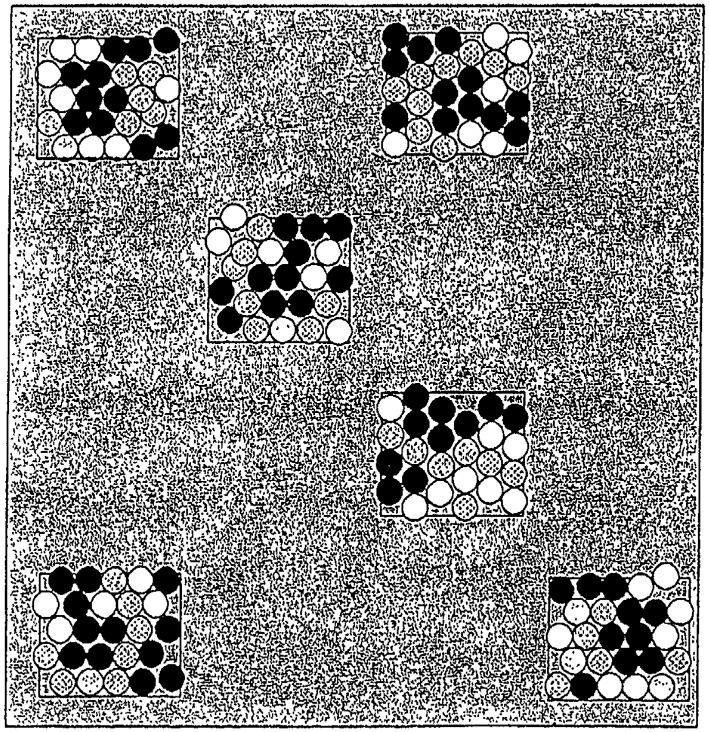

Figure 28

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LIGHT-INDUCED FLUID FLOW

Figure 29